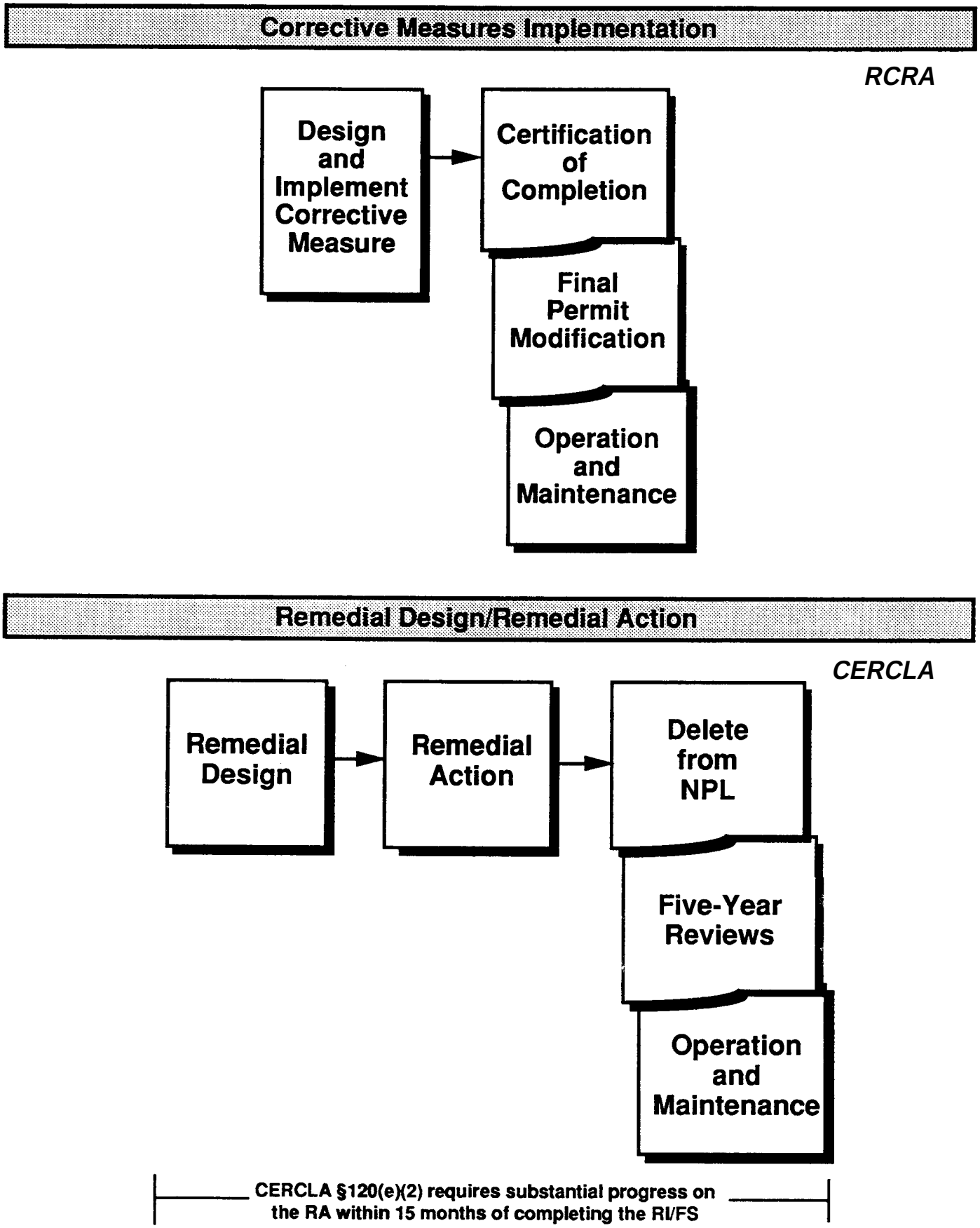
# Chapter 4
# RCRA Corrective Measures Implementation and CERCLA Remedial Design/Remedial Action

Figure 4-1


Corrective Measures Implementation
RCRA
Design and Implement Corrective Measure
Certification of Completion
Final Permit Modification
Operation and Maintenance
Remedial Design/Remedial Action
CERCLA
Remedial Design
Remedial Action
Delete from NPL
Five-Year Reviews
Operation and Maintenance
CERCLA §120(e)(2) requires substantial progress on the RA within 15 months of completing the RI/FS

# Chapter 4
# RCRA Corrective Measures Implementation and CERCLA Remedial Design/Remedial Action

## 1. Introduction

The discussion of the RCRA Corrective Action process in this chapter addresses the design, construction, implementation, operation, and process for demonstrating completion of the corrective measure. This entire process is collectively referred to as Corrective Measures Implementation (CM I). The purpose of the CMI is to address, through a combination of source control and remedial activities, a release of hazardous wastes or hazardous waste constituents from solid waste management units (SWMUs) at RCRA permitted or interim status treatment, storage, or disposal facilities (TSDFs). The discussion also addresses the final permit modification process, which discharges the facility's obligation to conduct RCRA Corrective Action once the corrective measure is completed.

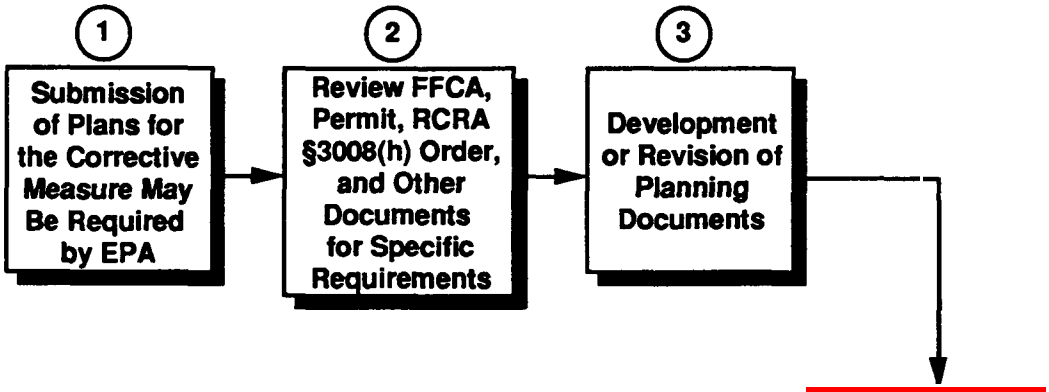
The discussion of the CERCLA Remedial Process addresses the remedial design and remedial action (RD/RA) process. Similar to the CMI, RD/RA is the implementation of the remedy selected following the remedial investigation/feasibility study (RI/FS). The discussion also addresses the process for deleting the site from the National Priorities List (NPL), and the requirements for 5-year reviews of the effectiveness of the RA at sites with residual contamination.

The specific topics discussed in this chapter include the following:

- The process and requirements for the design of the corrective measure,
- The process and requirements for the remedial design,
- Typical activities to be conducted durng the construction and implementation of the corrective measure or remedial action,
- The mechanism end requirements for demonstrating completion of the corrective measure or remedial action,
- The final permit modification process ending a facility's obligation to conduct RCRA Corrective Action,
- The process for NPL deletion end the 5-year review requirement, and
- The requirements for long-term operation and maintenance of the corrective measure or remedial action.

Figure 4-1 on the preceding page is a graphic representation of the sections discussed in this chapter.

PLANNING THE CORRECTIVE MEASURE

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## II. RCRA Corrective Measures Implementation: Design of the Corrective Measure

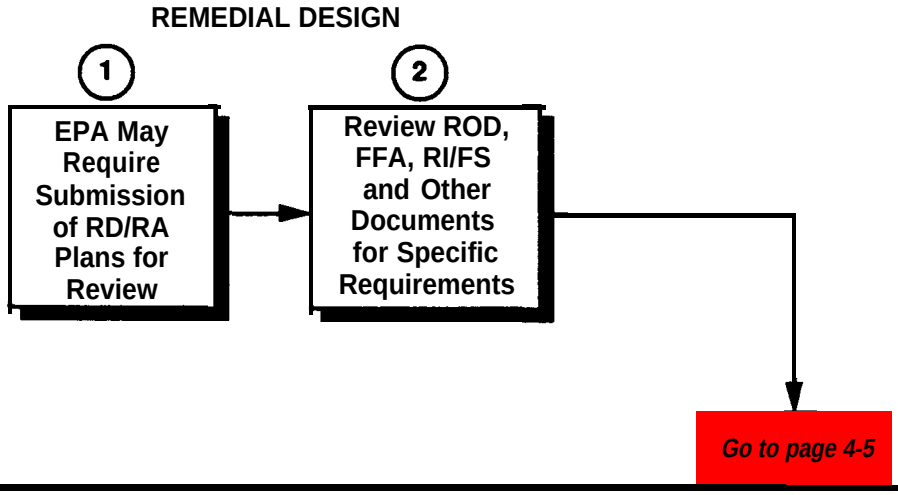
1. **Submission of Detailed Plans for the Corrective Measure.** Under proposed 40 CFR §9264.527, EPA may require DOE to submit detailed plans that include design and performance specifications, complete construction drawings, and operational plans for the corrective measure. Such a requirement usually appears in the facility schedule of compliance in the modified permit or in the Federal Facility Compliance Agreement (FFCA).

2. **Review Existing Documents.** The first task in developing a work plan for the implementation of the selected corrective measure is a review *of all documents* related to the facility, the unit, and the release. These documents include the following:

- **The facility permit RCRA §3008(h) Order, and/for FFCA for the facility which specifies the corrective measure for the unit, the requirements for demonstrating compliance, the media cleanup standards (MCS], and any other requirements placed on the facility and**
- **The reports of investigation already conducted at the facility including the CMS report, the RFI report. the RCRA Facility Assessment (RFA) report, reports of interim measures, and notices of releases.**

DOE should review these documents for information on conditions at the facility, the specific requirements of the permit, and the alternative selected for implementation. This step is extremely important when those responsible for implementing the corrective measure have not been involved in the previous RCRA Corrective Action activities at the facility.

3. **Development or Revision of Plans or Other Documents.** EPA has not promulgated regulations that provide specific requirements for the plans to implement the corrective measure. However, CMI planning typically involves development of, or revisions to, several documents, discussed in the following steps.




## III. CERCLA Remedial Design

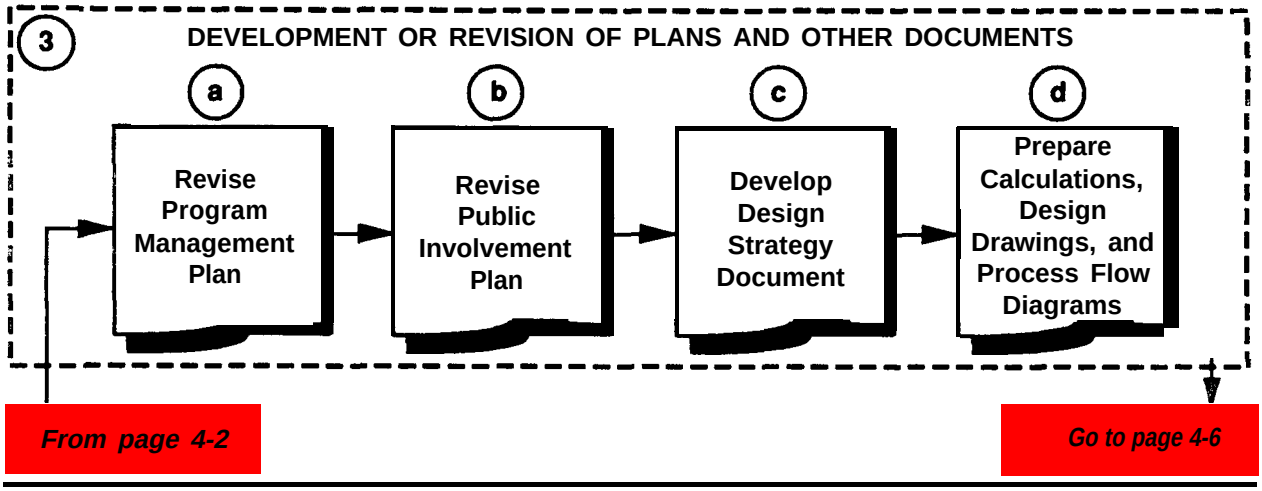
1. **Submission of RD/RA Plans.** Once the remedy is selected and the ROD is completed, DOE will begin the design of the full-scale remedy. Under 40 CFR §300.435(b)(2), EPA may require DOE to submit detailed plans of the remedy, including design and performance specifications, complete construction drawings, and operational plans for conducting the remedial action (RA). Requirements for submission of the design and planning documents usually appear in the schedule established in the Consent Agreement for the RA or in the Federal Facility Agreement (FFA).

2. **Review Existing Documents.** The first task to conduct during RD is to review all documents related to the facility, the operable unit(s), and the release. These documents include the following:

   - **The ROD and the FFA, which specify the RA activities that must be conducted; the requirements for demonstrating that the RA is completed; end any additional requirements; and**
   - **The reports of investigations and actions already conducted at the facility, with particular attention being paid to the RI/FS report, any interim remedial action reports, end the accompanying interim RODS.**

   DOE should review these documents for information on conditions at the facility, the specific requirements of the FFA, and the alternative selected for implementation. This step is extremely important, especially when the RD/RA contractor has not been previously involved in the activities at the site.

PLANNING THE CORRECTIVE MEASURE



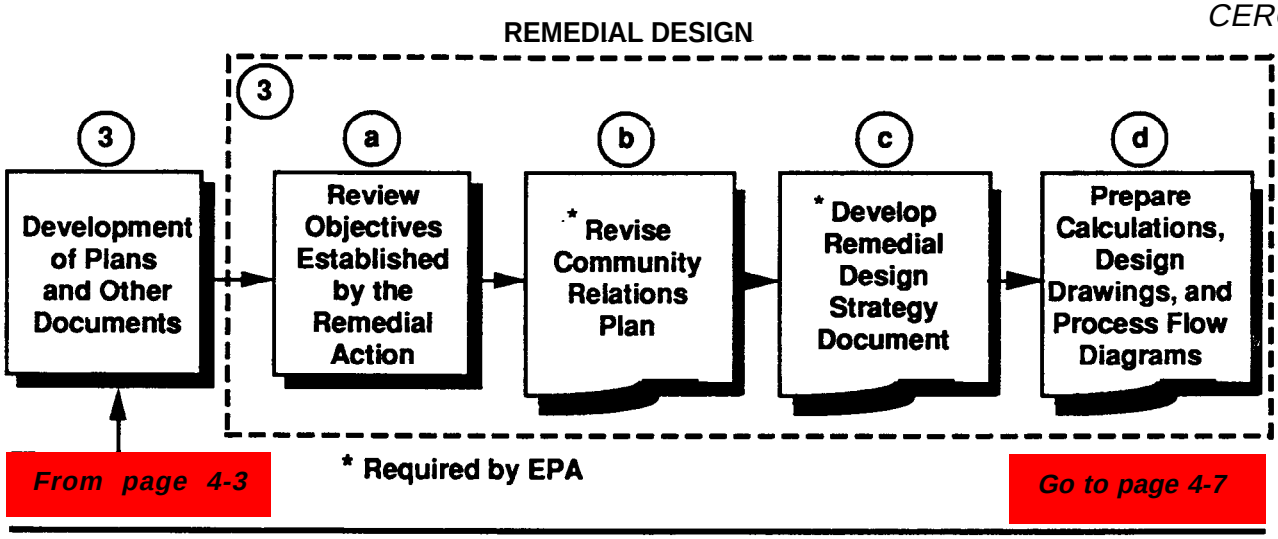

**a.** The ***program management plan (PMP) developad during the RF1/CMS phase may need to be revised*** to describe the overall management strategy for implementing the corrective measure, to establish roles and responsibilities of the personnel involved in the project, and to provide a description of the qualifications of the personnel assigned to the project.

**b.** ***The public involvement plan (PIP) may need to be updated*** to reflect the need to keep the public abreast of progress and/or problems as the CMI proceeds. Upon completion of the engineering plans and design, the facility should prepare and distribute an updated fact sheet and may wish to conduct an informal public hearing to discuss the implementation of the corrective measure. Preparation and distribution of additional fact sheets and regularly scheduled informal public hearings should be conducted throughout the implementation process. This additional effort will keep the public aware of the progress in implementing the corrective measure. DOE has developed a guidance document titled *Public Participation in Environmental Restoration Activities* which provides specific information on the elements of a PIP.

**c.** As described in the *RCRA Corrective Action Program Guide,* DOE should ***prepare a design strategy document*** describing the manner and methods to meet the requirements of applicable Federal, State, and local regulations for performance and construction; minimize environmental and community impacts; address the technical factors related to the design; account for assumptions made in developing the design; and account for possible sources of error in the design process.

The design strategy document bears a strong relationship to the ROD prepared as part of conducting an environmental impact statement (EIS). The facility may wish to consider developing the ROD for the EIS (if NEPA compliance is required) in a manner that will allow the ROD to be used to fulfill the requirements for the design strategy document.

**d.** Once the review and planning phases are completed, DOE should ***prepare a complete set of detailed construction drawings, document all engineering calculations, and prepare a complete set of process flow diagrams for the corrective measure.*** These drawings should show the entire process of the corrective measure and should include details on both onsite and offsite treatment systems.




3. **Development or Revision of Planning Documents.** EPA has not promulgated regulations that provide specific requirements for the plans developed during the RD phase of a CERCLA response. Because each RA is unique to the site conditions, development of specific requirements for RD would be difficult. However, RD is essentially an engineering project; thus, there are some common elements to most RDs. In addition to these common elements, RD may also involve development of, or revisions to, documents prepared during the preceding activities. The RD process is discussed in more detail in the following steps.

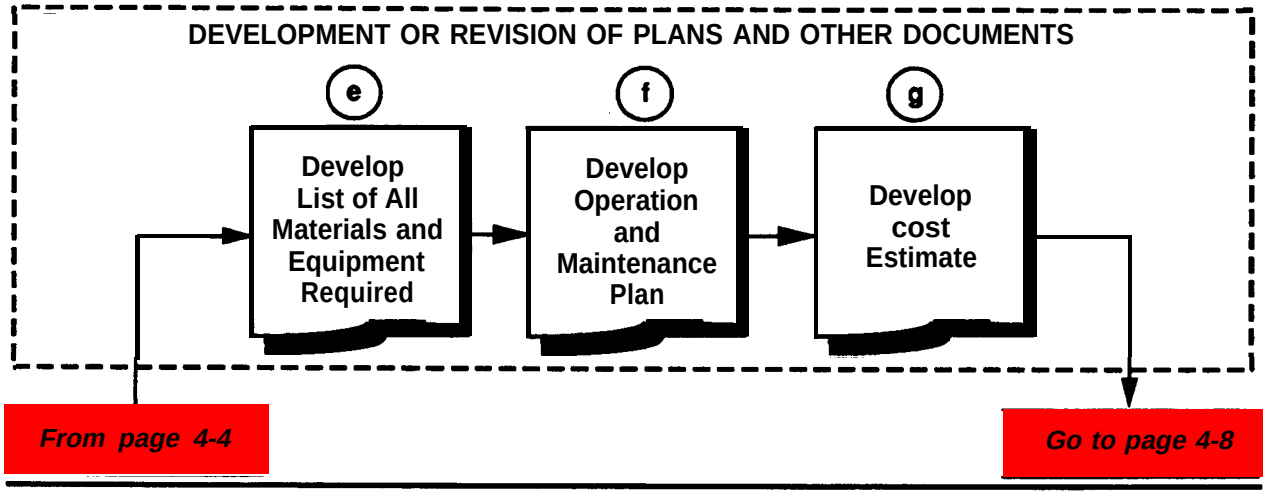
a. The first step in the RD is to ***review the objectives established for the RA.*** Preliminary remedial action objectives were established during the Ri/FS, and specific health, ecological, and ARAR-based cleanup goals were identified during the risk assessment and feasibility study. These objectives are often included in the FFA or Consent Order. These objectives form the basis for the design of the RA.

b. ***The CRP may need to be updated*** to reflect the need to keep the public abreast of progress and/or problems as the RD/RA proceeds and to ensure compliance with 40 CFR §300.435(c). Upon completion of the engineering plans and design, DOE should prepare and distribute an updated fact sheet and conduct a public briefing to discuss the RA. Preparation and distribution of additional fact sheets and regularly scheduled informal public hearings should be conducted throughout the implementation process. This additional effort will keep the public aware of progress in conducting the RA.

c. A recommended practice is to prepare ***an RD strategy document*** to describe the manner and methods to meet the requirements of applicable Federal, State, and local regulations for performance and construction (i.e., Applicable or Relevant and Appropriate Requirements [ARARs]); to minimize environmental and community impacts; to address the technical factors" related to the design; to account for assumptions made in developing the design; and to account for possible sources of error in the design process. A design strategy document bears a strong relationship to a ROD or Environmental Assessment or Environmental Impact Statement (EIS). DOE may wish to consider developing the ROD for the EIS (if NEPA compliance is required) in a manner that will allow the ROD to be used to fulfill the requirements for this document.

d. Once the review and planning phases are completed, DOE should prepare ***a complete set of detailed construction drawings, document all engineering calculations. and prepare a complete set of process flow diagrams for the RA.*** This document should include details on both on- and offsite treatment systems. In the case of offsite disposal of hazardous wastes, this document should reflect the EPA off-site final rule requirement that a RCRA Facility Assessment be conducted at any RCRA hazardous waste TSDF that receives hazardous wastes generated during the RA (see 58 FR 49200).

PLANNING THE CORRECTIVE MEASURE

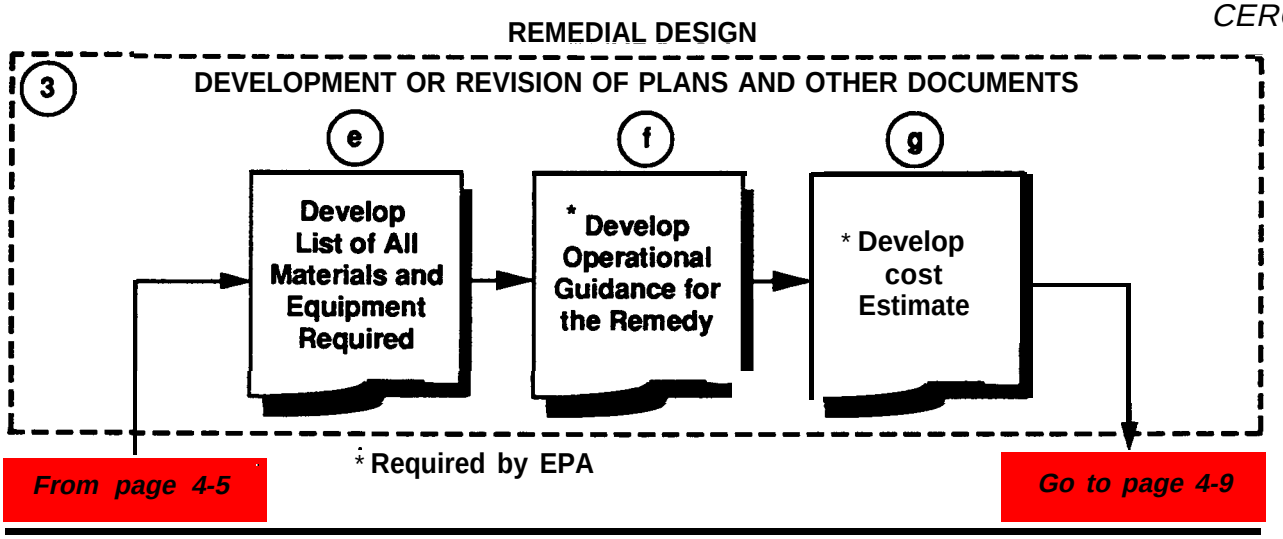



**e.** ***A list of, and specfications for, all equipment and materials*** required to implement the corrective measure should be prepared. Included in this list are all equipment required to ensure employee health and safety (specified in the Health and Safety Plan [HASP]); all materials required for construction of the corrective measure, including materials and specifications for prefabricated sections; all construction equipment required to implement the corrective measure (such as heavy equipment, special tools, and special materials handling devices) and the source and availability of this equipment; and a summary of specifications for the materials and equipment required for implementation of the corrective measure. These items should be included in the construction quality assurance plan (CQAP).

**f.** DOE will need to ***prepare an operation and maintenance plan (O&MP)*** for the corrective measure which describes (1) normal operation and maintenance procedures, (2) potential problems and anticipated solutions to such problems, (3) routine monitoring or testing procedures, (4) safety procedures, (5) equipment related to the corrective measure, and (6) record keeping and reporting procedures and requirements.

**g.** The next task in planning the corrective measure is ***development of a cost estimate.*** This estimate should reflect the fully loaded cost of the corrective measure. Fully loaded cost includes all short- and long-term costs and estimates of the extent of all long-term liabilities. Examples of information to include in the cost estimate are as follows:

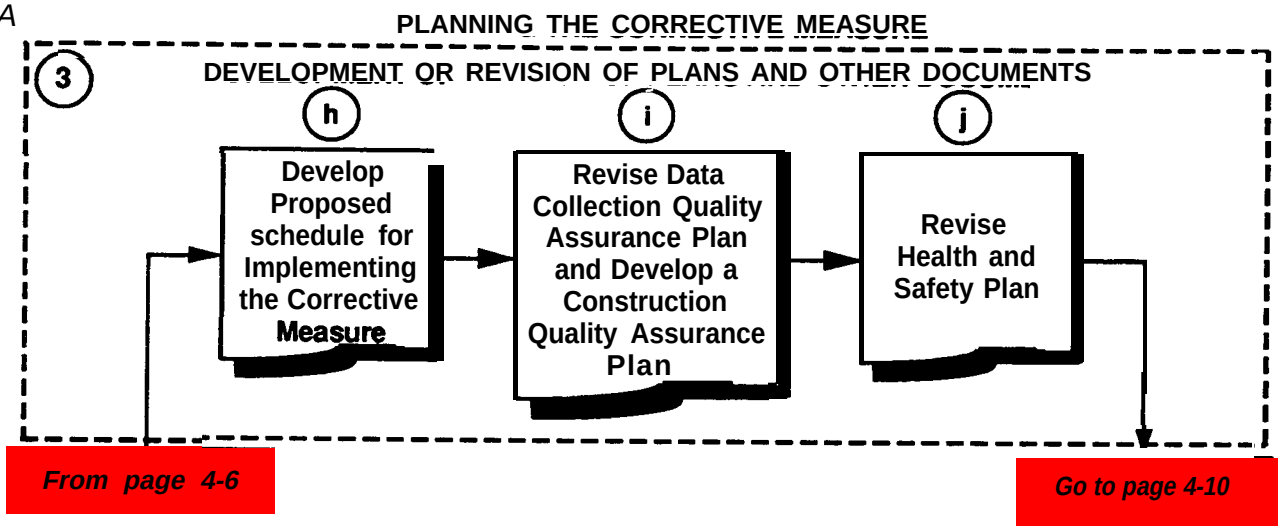
- **The cost of all materials required to construct the corrective measure;**
- **The costs associated with the manpower required to implement the corrective measure, including salaries, insurance, required contributions (e.g., Social Security), health monitoring, and specialized training;**
- **Costs for overhead, operations, and profit; and**
- **The cost of offsite waste disposal, including costs for long-term liabilities related to waste disposal.**




**e.** Once the basic design of the RA is completed, ***a list of and specifications for, all equipment and materials required to implement the RA should be prepared.*** Included in this list is all equipment required to ensure employee health and safety (specified in the HASP); all required construction materials and vendor-supplied devices (including materials and specifications for vendor-supplied equipment); all construction equipment required to implement the remedy (i.e., heavy equipment, special tools, special materials handling devices), and the source and availability of these materials or equipment. In addition, DOE should consider developing a summary of the specifications for the materials and equipment required for the RA and include this summary in the construction quality assurance plan (CQAP).

**f.** DOE will then need to prepare ***operation/guidance*** for the remedy. This guidance should discuss normal operational procedures, potential problems and anticipated solutions to such problems, all routine monitoring or testing procedures, safety procedures, information on all equipment or devices related to the remedy, and the record keeping and reporting procedures and requirements. Related to this portion of the RD process is development of training materials for the personnel who will be involved in operation of the RA.

**g.** Once the design, materials, and operational guidance are complete, DOE should develop a ***cost estimate*** for the RA. The cost estimate should reflect the capital costs for implementing the RA and the present net worth of the RA. Present net worth reflects the total cost over the entire period of the RA, and includes all direct and indirect costs (including long-term liabilities) of the RA.

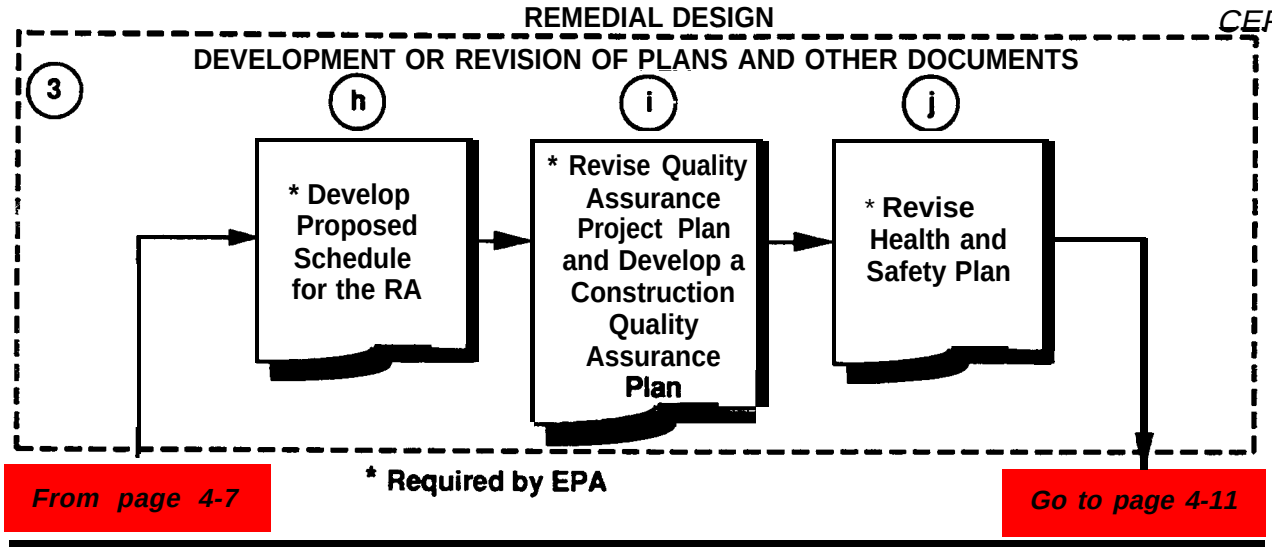



**h.** DOE must develop ***a proposed schedule*** for implementing the corrective measure which includes the following:

- **Any reporting requirements established in the permit, RCRA §3008{h) Order, or FFCA, such as implementation progress reports or monitoring and sample analysis reports;**
- **A critical path analysis highlighting extremely critical functions, activities, or decisions which, if not met, would force the facility to request a modification of the schedule of compliance; end**
- **Identification of the significant milestones of the implementation process such as the completion of important phases in the construction, dates for conduct and completion of acceptance testing, dates for actual implementation of the corrective measure. and dates for progress reviews, inspections, or other functions related to implementing the CQAP or date collection quality assurance plan (DCQAP).**

**i.** As a corrective measure requires sampling and analysis to demonstrate compliance with MCS, DOE will need to ***revise the DCQAP*** used during the RFI and CMS. In conjunction with the revision of the DCQAP, proposed 40 CFR §264.527(a)(4) requires DOE to ***develop a CQAP*** for the construction activities in the implementation process. While a CQAP is different in nature and scope from a DCQAP, DOE may elect to use the same format for preparing the CQAP document. The CQAP will specify testing methods to ensure that materials meet specifications, establish an inspection program, and provide the details for acceptance testing of the corrective measure.

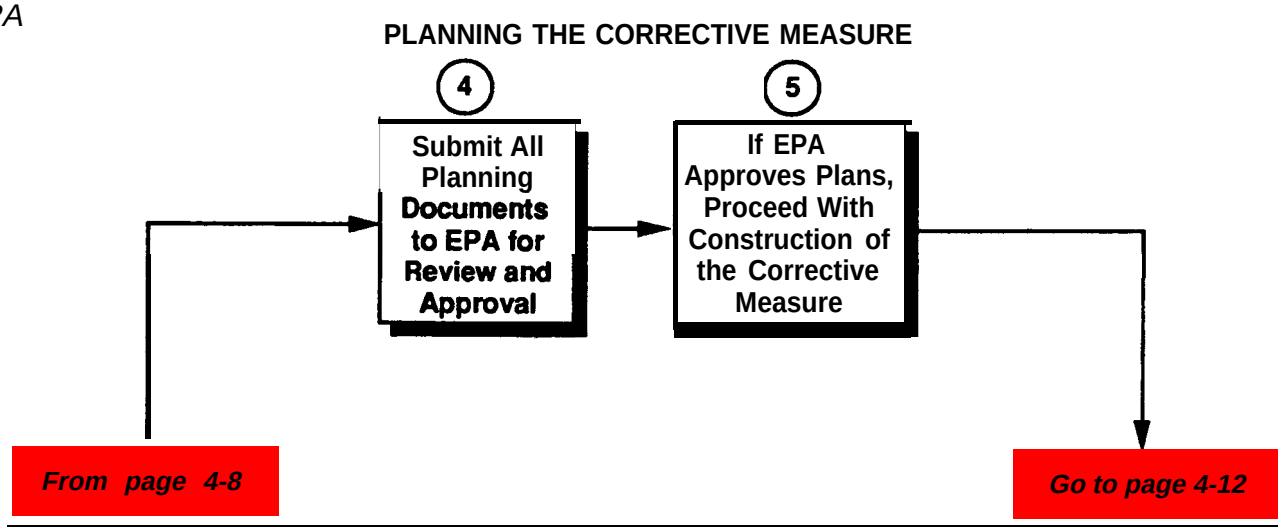
**j.** ***The Health and Safety Plan (HASP)*** used during the RFI and CMS will also need revision to reflect the need for employee protection during the CMI. It may be possible to incorporate these revisions into the facility's HASP.




**h.** Once the preceding RD activities are completed, DOE should develop a ***proposed schedule*** for the RA and compare it to the schedule in the ROD or FFA. If there are discrepancies, a modification of the schedule set forth in the ROD or FFA will need to be negotiated and prepared in accordance with 40 CFR §300.435(c)(2). The schedule for the RA should reflect any required reporting requirements, such as implementation progress reports or monitoring and sample analysis reports. A useful tool in the schedule planning is a critical path analysis that identifies extremely critical functions, activities, or decisions which, if not met, would force the facility to request a modification of the schedule. Finally, the schedule should identify significant milestones of the implementation process.

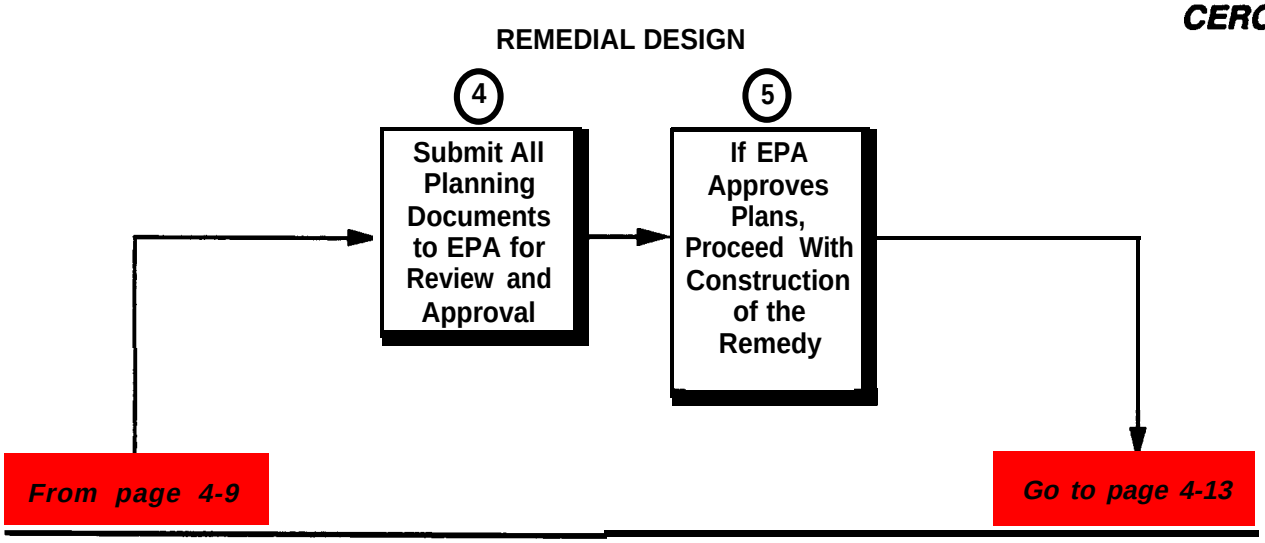
**i.** Remedial actions require sampling and analysis to demonstrate the effectiveness of the implemented remedy. Because sampling and analysis is an integral part of the RA, DOE should revise the ***QAPP*** developed for the RI/FS. In conjunction with the revision of the QAPP, DOE should develop a CQAP for the construction activities in the implementation process. While a CQAP is different in nature and scope from a QAPP, DOE may elect to use the same format for preparing the CQAP document. The CQAP will specify testing methods to ensure materials meet specifications, establish an inspection program, and provide the details for acceptance and performance testing of the implemented remedy.

**j.** The ***HASP*** used during the RI/FS will also require revision. These changes should reflect the need for employee protection during the construction, testing, and operational life of the remedy.




4. **EPA Review of Planning Documents.** Once the required documents are completed, DOE submits them to EPA for review and approval. The facility permit or FFCA will usually contain the specific requirements for document submission.

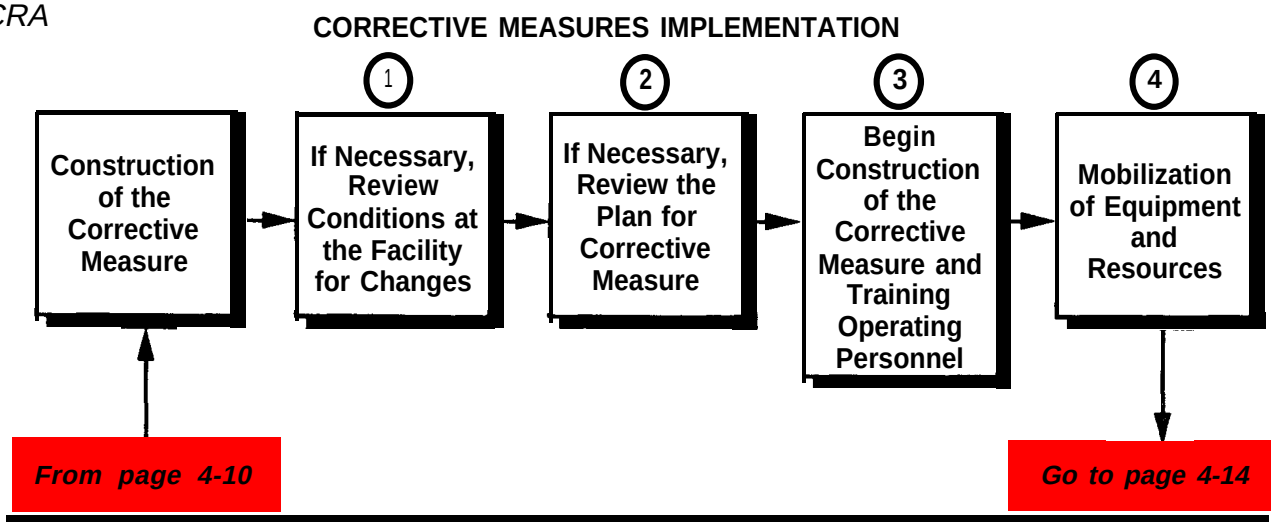
5. **EPA Approval of Planning Documents.** EPA will review and either approve or reject the documents submitted by DOE. If the documents are unacceptable to EPA, DOE should request a meeting with EPA to discuss and negotiate any revisions before revising the documents. DOE should recognize that under the proposed Subpart S rule, discussion and negotiation of any revisions are a discretionary action by EPA. EPA could, within its authority, unilaterally revise the document and require the facility to implement the revised plan. Once these discussions and negotiations are complete, the facility should revise and resubmit the documents to EPA. Only when EPA has approved the documents should construction and/or implementation of the corrective measure begin.




**4.** **Submit All Planning Documents to EPA.** Once the RD process is completed, DOE should submit to EPA all documents that EPA wishes to review. These documents are usually identified in the FFA or Consent Agreement. These documents will include:

- **The Community Relations plan.**
- **The RD strategy,**
- **The operational guidance,**
- **The cost estimate,**
- **The proposed schedule for the RA,**
- **The QAPP and CQAP, and**
- **The HASP.**

**5.** **Proceed with Construction of Remedy.** EPA will review and either approve or reject the documents submitted by DOE. If the documents are unacceptable to EPA, DOE should request a meeting with EPA to discuss and negotiate any revisions before revising the documents. Once these discussions and negotiations are complete, the facility should revise the documents and resubmit them to EPA. Only when EPA has approved the documents should actual construction of the remedy begin.




## IV. Construction of the RCRA Corrective Measure

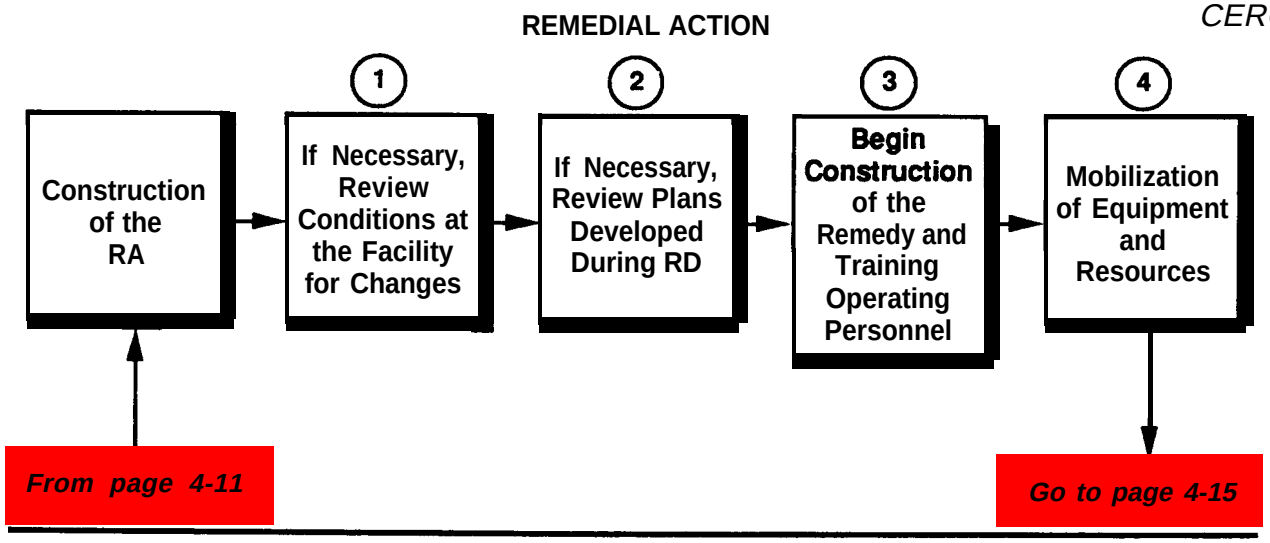
As mentioned previously, implementing the corrective measure is a two-phase process. The first phase involves the design, specifications, and planning for CMI. This discussion focuses on the second phase of CM I and involves construction, acceptance testing, and operation of the corrective measure.

1. **Verify Site Conditions.** The first task in the preliminary phase of implementation is to verify the conditions at the facility through review of the RCRA Facility Investigation (RFI) report, the Corrective Measures Study (CMS) report, and the facility permit and Statement of Basis. This step is required only if those implementing the corrective measure are unfamiliar with the conditions at the facility.

2. **Review Implementation Plans.** The next phase of the preliminary implementation is to review the implementation plans, drawings, and calculations. Again, this step is required only if those implementing the corrective measure are unfamiliar with the design and specifications for it.

3. **Begin Construction of Corrective Measure.** If the plans, drawings, and other documents are satisfactory, construction of the corrective measure can begin. Concurrent with the construction of the corrective measure, DOE should ensure that the personnel who will be responsible for the operation and maintenance of the corrective measure are properly trained.

4. **Mobilize Equipment and Resources.** The initial phase of construction is mobilization of the necessary equipment, personnel, and resources. Mobilization of resources is often a complex process and can take many months to complete. Included in mobilization is the acquisition of any equipment, tools, materials, prefabricated structures or devices, and the hiring and training of the personnel required for construction of the corrective measure.




## V. CERCLA Remedial Action: Construction of the Remedy

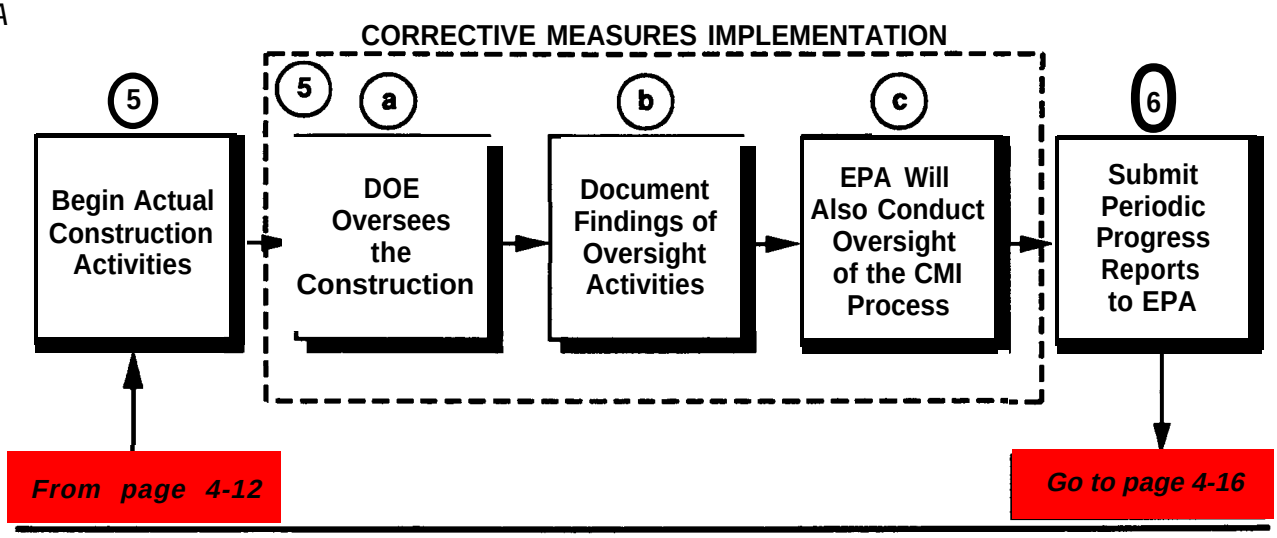
Implementing the remedy is a two-phase process. The first phase involves the actual construction and operation of the remedy, and the second involves the operation of the remedy until all remedial objectives are achieved at the site.

1. **Verify Site Conditions.** The first task in constructing and implementing the remedy is to verify the conditions at the site through review of the RI/FS, ROD, Consent Agreement, and/or FFA. This step is required only if the contractor constructing and implementing the remedy is unfamiliar with the conditions at the site.

2. **Review Plans Developed During RD.** The next phase of the preliminary implementation is to review the implementation plans, drawings, and calculations developed during the RD. Again, this step is required only if those constructing or implementing the remedy are unfamiliar with the design and specifications for the remedy.

3. **Begin Construction and Training of Operating Personnel.** If the plans, drawings, and other documents are satisfactory, construction can begin. Concurrent with the construction and implementation of the remedy, DOE should ensure that personnel who will be responsible for the operation of the remedy are properly trained.

4. **Mobilize Equipment and Resources.** The initial phase of construction is mobilization of the necessary equipment, personnel, and resources. Mobilization of resources is often a complex process and can take many months to complete. Included in mobilization is the acquisition of any equipment, tools, materials, prefabricated structures or devices, and the hiring and training of the personnel required for construction of the remedy.



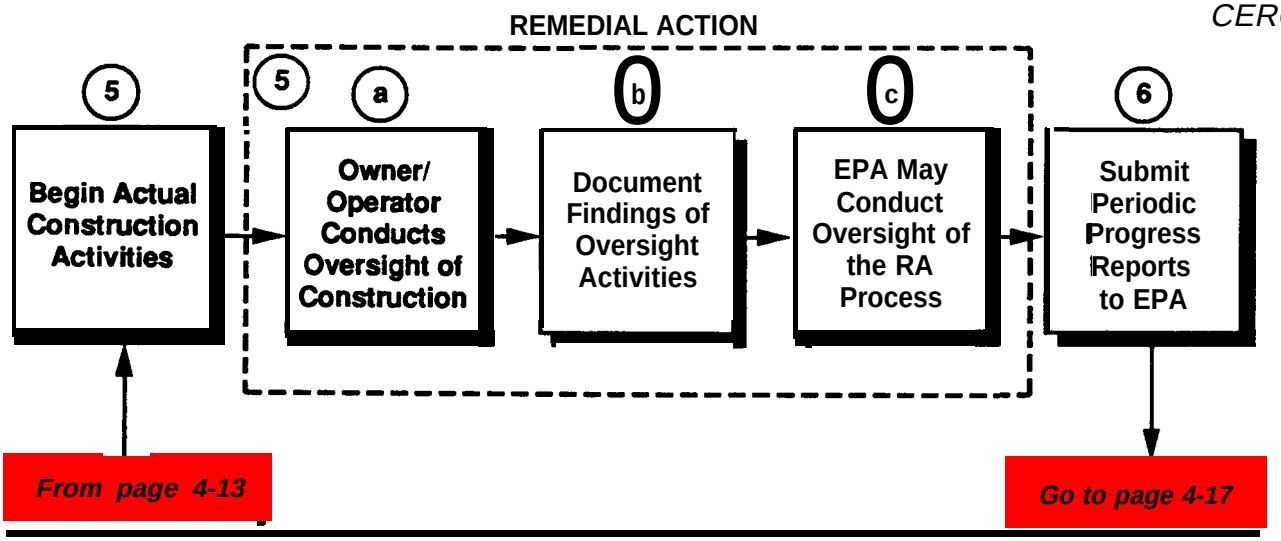

5. **Begin Construction Activities.** Actual construction of the corrective measure is the next step in the process. The construction process includes conducting necessary quality assurance procedures and inspections, and preparing reports.

a. DOE must ***oversee all phases of implementation*** including the construction and acceptance testing activities. This function ensures that the construction of the corrective measure complies with the specifications and requirements detailed in the planning process for implementation, the terms of any contracts for construction or operation, and the applicable requirements of the CQAP and DCQAP.

b. DOE should ***document the findings of ail oversight activities.*** Such reports are valuable for developing periodic progress reports for submission to EPA, providing information on the effectiveness of the corrective measure when attempting to demonstrate compliance with the terms of the permit or RCRA §3008(h) Order, and substantiating any claims of “reasonable effort" if the facility requests a determination of technical impracticability.

c. Under proposed 40 CFR §264.529, ***EPA will conduct periodic inspections*** to assess the progress in implementing the corrective measure. In performing this function, EPA will review the periodic progress reports submitted by the facility, and may also conduct onsite inspections and oversight of the design, construction, operation, and maintenance of the corrective measure.

6. **Submit Periodic Progress Reports to EPA.** While construction is under way, DOE will need to prepare and submit any periodic progress reports required by the permit, RCRA §3008(h) Order, or FFCA. An example would be a report on the progress of constructing a particular treatment unit, including information on the progress of construction, the results of inspections and acceptance testing, and success in adhering to the schedule of compliance.



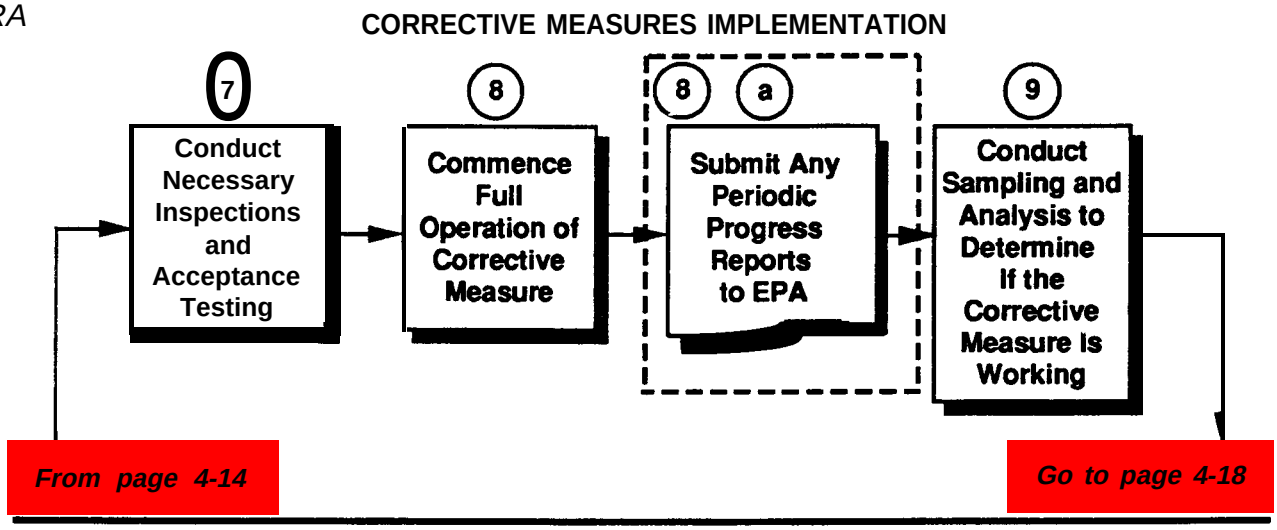

5. **Begin Construction Activities.** Actual construction of the remedy is the next step in the process. The construction process includes conducting necessary quality assurance procedures and inspections and preparing periodic reports on the progress of construction.

a. DOE must ***oversee all phases of implementation*** including the construction and acceptance testing activities. This function ensures that the construction of the remedy complies with the specifications and requirements detailed in the planning process for implementation, the terms of any contracts for construction or operation, and the applicable requirements of the CQAP and QAPP.

b. DOE should ***document the findings of all oversight activities.*** Such reports are valuable for developing periodic progress reports for submission to EPA and providing information on the effectiveness of the remedy at addressing the contamination at the site. This information will be important when attempting to demonstrate achievement of the RA objectives.

c. The NCP does not specifically state that ***EPA will conduct periodic inspections*** of the RA process; however, such inspections may be conducted to assess the progress of the RA. In performing this oversight function, EPA may review the periodic progress reports submitted by DOE, and may also conduct onsite inspections and oversight of the design, construction, operation, and maintenance of the remedy. These activities are likely in cases where a facility was not required to obtain a permit (e.g., an NPDES permit) for a particular remedy that would normally require one.

6. **Submit Periodic Progress Reports to EPA.** While construction is under way, DOE will need to prepare and submit any periodic progress reports required under the FFA. An example would be a report on the progress of constructing a particular treatment unit, including information on the progress of construction, the results of inspections and acceptance testing, and success in adhering to the schedule set forth in the ROD.



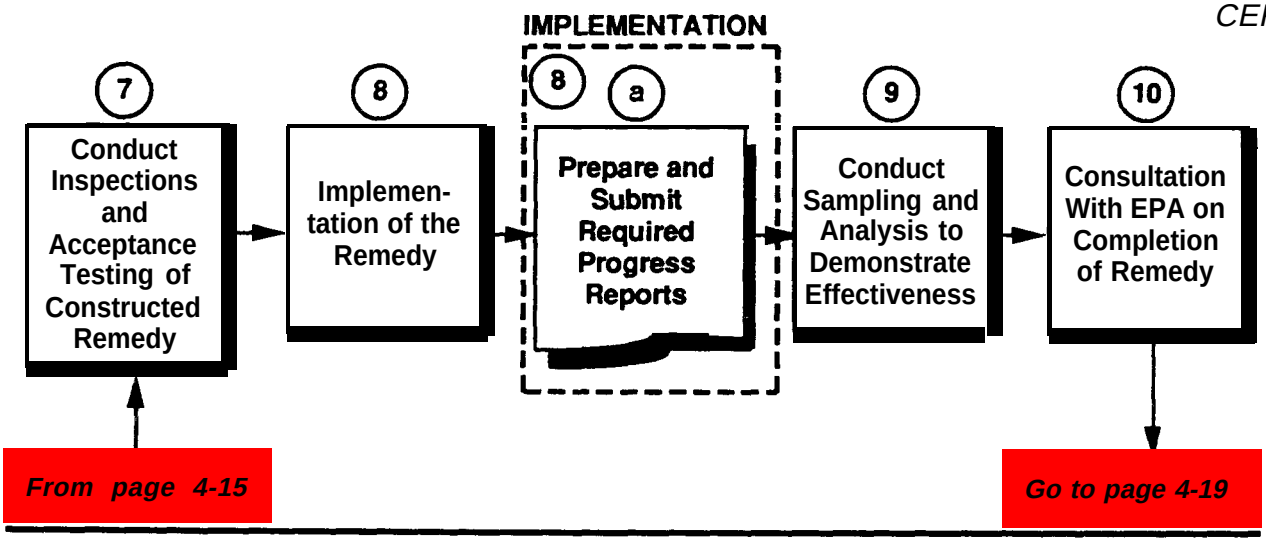

**7. Conduct Inspections and Acceptance Testing.** Upon completion of any phase of the construction of the corrective measure, DOE needs to conduct the inspections and acceptance testing specified in the CQAP. This process will ensure that the corrective measure meets the specifications and performance standards established for the corrective measure.

## VI. Operation and Maintenance of the RCRA Corrective Measure

**8. Commence Full Operation of Corrective Measure.** Once the corrective measure construction and acceptance testing is completed, DOE begins the operations and maintenance process. This consists of implementing the operations and maintenance plan and conducting the sampling and analysis required to demonstrate compliance. The sampling and analysis must conform to the requirements of the DCQAP developed during the planning process.

**a.** During the operation of the corrective measure, DOE needs to ***prepare and submit any progress reports*** required under the permit or FFCA.

**9.** Conduct **Sampling to Determine Effectiveness of Corrective Measure.** At the completion of each round of sampling and analysis, the results are compared against the media cleanup standards (MCS) established in the facility permit. Once the contamination concentrations are at or below the MCS set forth in the facility's permit, Order, or FFCA, the period over which the facility must demonstrate compliance begins.




**7.** **Conduct Inspections and Acceptance Testing.** During the construction of the remedy, DOE needs to conduct inspections and acceptance testing. The requirements and procedures for these inspections should be specified in the CQAP. While this process is not a specific requirement of the RA process, it does help ensure that the remedy meets specifications and performs to the required standards.

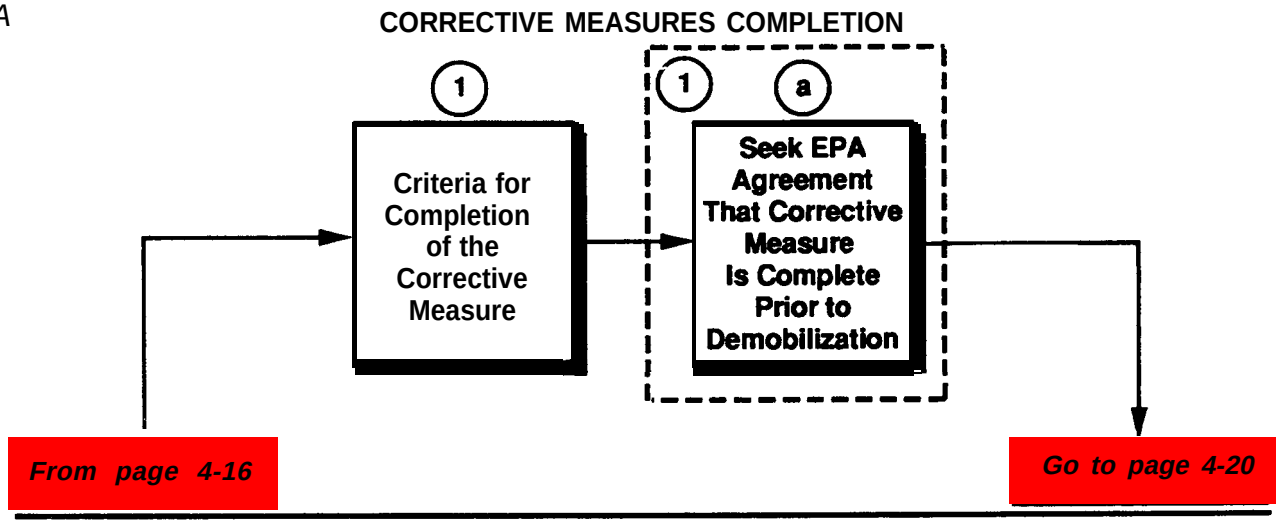
## VII. Implementation of the CERCLA Remedy

**8.** **Implementation of the Remedy.** Once the construction and acceptance testing of the remedy is completed, DOE begins its implementation. This involves implementing the operational procedures developed during RD and conducting the sampling and analysis required to demonstrate the effectiveness of the remedy. The sampling and analysis must conform to the requirements of the DCQAP developed during the planning process.

**a.** While the remedy is operational, DOE needs to ***prepare and submit to EPA any periodic progress reports*** required under the Consent Order or FFA. These reports are also useful in the community relations activities undertaken to keep local interest groups apprised of progress on the RA.

**9.** **Conduct Sampling end Analysis to Demonstrate Effectiveness.** While the remedy is operational, DOE should conduct sampling and analysis to determine its effectiveness. Upon completion of each round of sampling, the results will be analyzed to determine if the remedy has achieved the remedial objectives set for the site. Once the contamination concentrations achieve specified remedial objectives, performance can begin.

**10.** **Consultation with EPA.** Once compliance with the remedial objectives is demonstrated for the required performance period, DOE should consult with EPA to determine if the RA has met the requirements for certification of completion of the remedy.

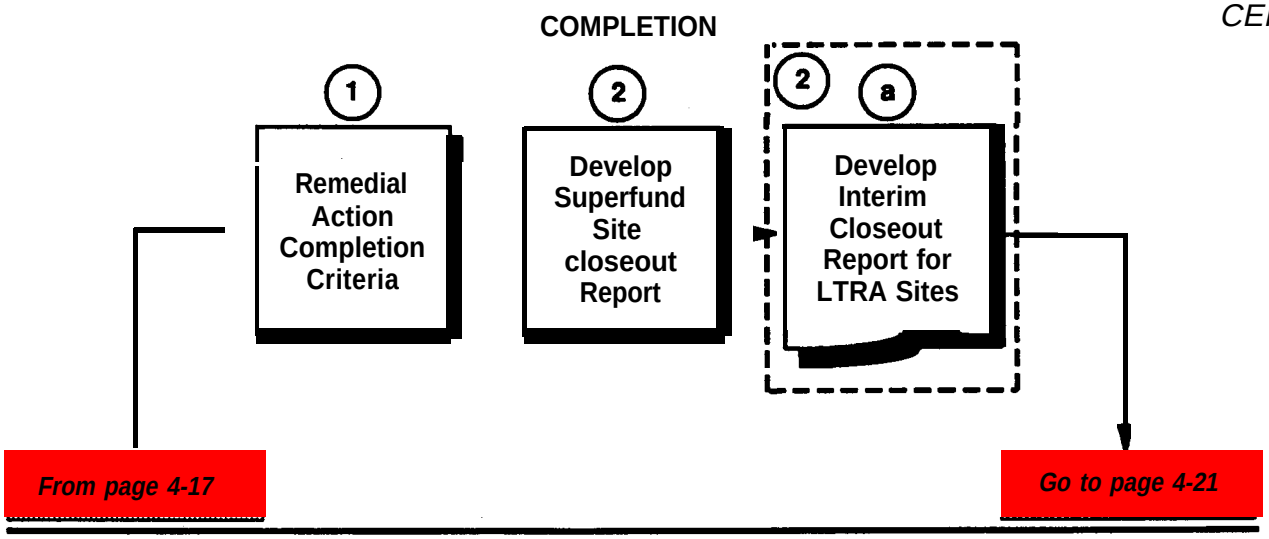



## VIII. Completion of the RCRA Corrective Measure

1. **Criteria for Completion of the Corrective Measure.** Under proposed 40 CFR §264.530(a), a corrective measure is complete when the following criteria are met:

- **DOE demonstrates compliance with all MCS specified in the facility permit, for the required performance period, at all points of compliance specified in the facility permit**
- **All source control measures specified in the facility permit are completed;**
- **The removal or decontamination (often referred to as demobilization) of all units, equipment, devices, or structures required to implement the corrective measure is completed; and**
- **DOE can provide information demonstrating compliance with the requirements for management of the wastes generated during the corrective measure.**

**a.** Although the proposed Subpart S rule requires completion of demobilization before the facility can discharge the requirements for corrective action, DOE should seek an official statement from EPA that the requirements for demonstrating compliance specified in the facility permit, RCRA §3008(h) Order, or FFCA have been met before engaging in demobilization.




## IX. Completion of the CERCLA Remedial Action

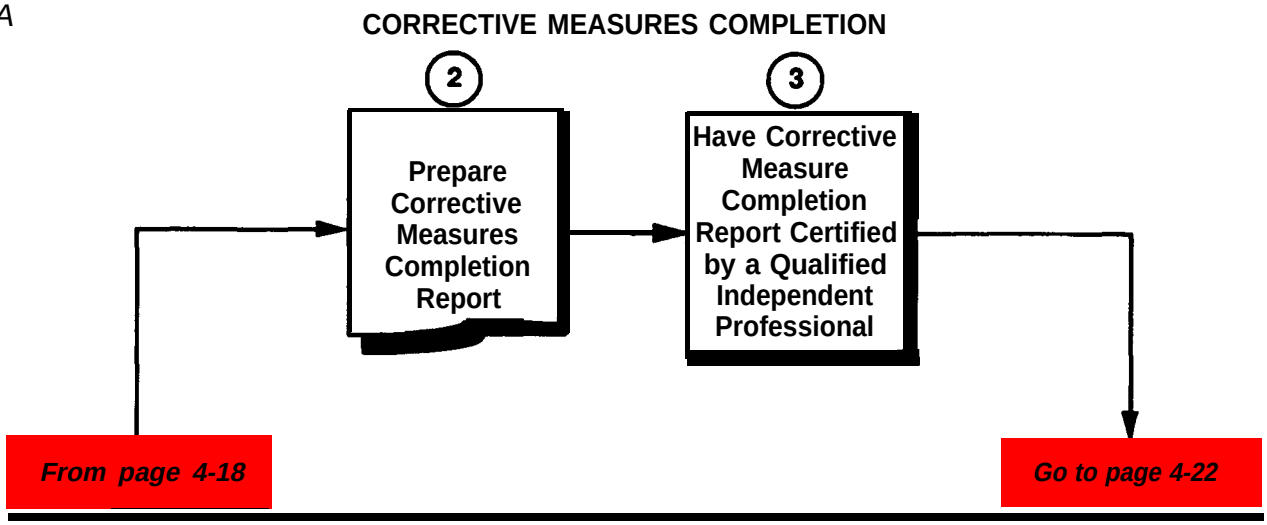
1. **Remedial Action Completion Criteria.** The EPA guidance document *Procedures for Completion and Deletion of National Priorities List (NPL) Sites* states that a CERCLA remedial action is considered complete when the following criteria are met:

- **The contamination of all exposure pathways at the site is remediated to levels deemed protective of human health and the environment,**
- **The specific cleanup levels set forth in the ROD are achieved and all remedial activities specified in the ROD are completed,**
- **The constructed remedy is fully operational and performing to design specifications, and**
- **The only remaining activities at the site involve operation and maintenance.**

2. **Develop Superfund Site Closeout Report.** Once these requirements are met, DOE prepares a Superfund Site Closeout Report justifying completion of the RA and including:

- **A summary of site history and conditions,**
- **Demonstration that all QA/QC requirements have been met,**
- **A determination that sufficient monitoring results have been collected to demonstrate compliance with the cleanup levels set forth in the ROD or FFA,**
- **Assurances that the operations and maintenance requirements for the remedy are capable of being successfully implemented, and**
- **Documentation that the site has been remediated to levels deemed protective of human health and the environment.**

**a.** In the case of long-term remedial action (LTRA) sites, an ***interim closeout report is developed.*** LTRAs are sites where achieving the remedial objectives requires continuous operation of the remedy over several years. When the cleanup levels are achieved, a final closeout report will be developed and submitted for EPA review and approval.

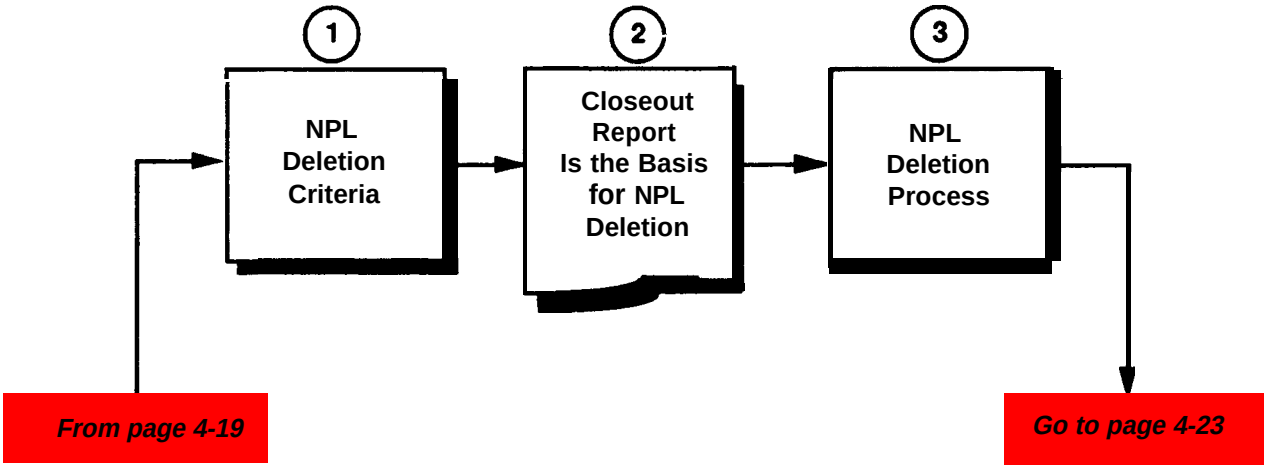



2. **Prepare Corrective Measures Completion Report.** When these requirements are met, DOE will prepare a Corrective Measures Completion Report (required under proposed 40 CFR §264.530[b]) which provides all the information necessary to support the claim that the corrective measure is complete. This report should include a discussion of the following areas:

- **A brief discussion of the history of the facility, including a discussion of the RCRA Corrective Action activities taken at the facility;**
- **A summary of the findings of the RFA, the RFI, and the CMS:**
- **A discussion of any interim measures conducted at the facility;**
- **A discussion of the corrective measure selected for the facility;**
- **A list of all MCS established for the facility;**
- **A discussion of the implementation of the corrective measure;**
- **A summary of the requirements for demonstrating compliance;**
- **Documentation that all MCS have bean achieved;**
- **Documentation that all source control measures have been successfully implemented; end**
- **Documentation of this removal or decontamination of all equipment, structures, and units used to implement the corrective measure.**

3. **Completion Report Certification by Independent Professional.** Under proposed 40 CFR §264.530(b), the facility will need to have this report reviewed and certified by one or more independent professionals with the appropriate technical expertise. The proposed Subpart S rule provides no information on how to select such a professional, stating that this will vary depending on the types of problems at the facility.

NPL DELETION




# X. National Priorities List Deletion for a CERCLA Site

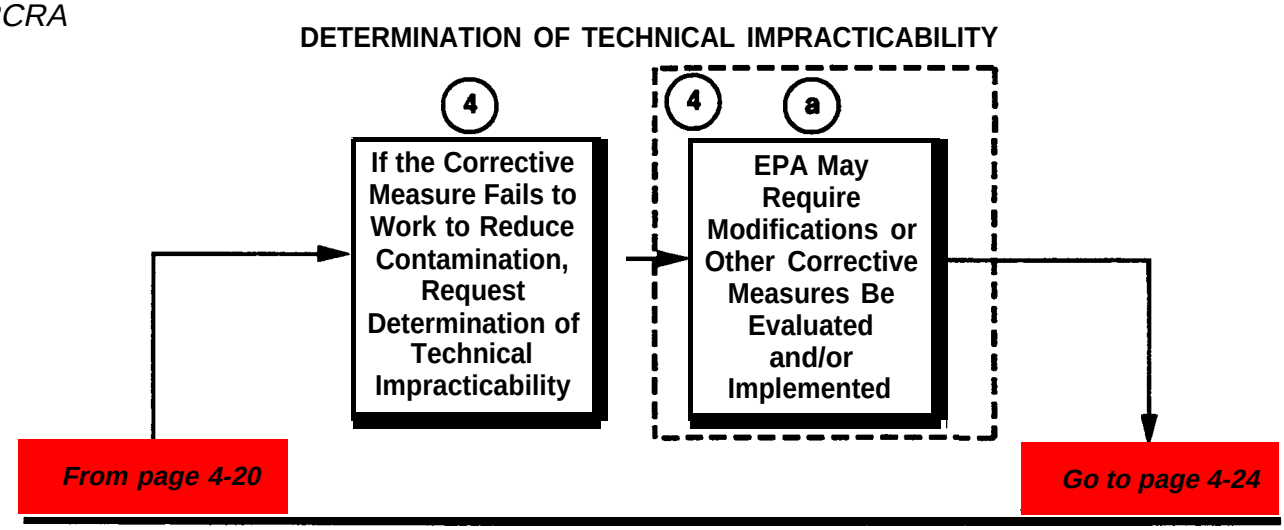
1. **NPL Deletion Criteria.** Upon completion of remedial action at a site, the site becomes eligible for deletion from the National Priorities List (NPL). The NPL deletion process is described in 40 CFR §300.435(e). The key criterion for NPL deletion is determination that no further CERCLA response action is required at the site. EPA will consider deleting a site from the NPL when the following criteria are met:

- **EPA, in consultation with DOE and the State, determines that all required response actions have been implemented at the site; and**
- **The site has been remediated to levels deemed protective of human health and the environment.**

2. **Closeout Report Is the Basis for NPL Deletion.** The Superfund Site Closeout Report is the basis for a site's deletion from the NPL. The NPL deletion process begins once the Closeout Report is approved by the EPA Regional Administrator and DOE submits to the EPA Regional Administrator a request for deletion from the NPL.

3. **NPL Deletion Process.** The deletion process has three steps, summarized as follows:

- **Initiation of the process involves receipt of a request for deletion from DOE, consultation with and concurrence from the State, EPA's compiling the deletion docket, end development of a Notice of Intent to Delete.**
- **The second step in the process is publication of a Notice of Intent to Delete the site from the NPL, a local notice of intent to delete, and the opening of a 30-day public comment period.**
- **The final step in the process is the development of a responsiveness summary to address the public comments received during the comment period, and publication of the Notice of Deletion.**

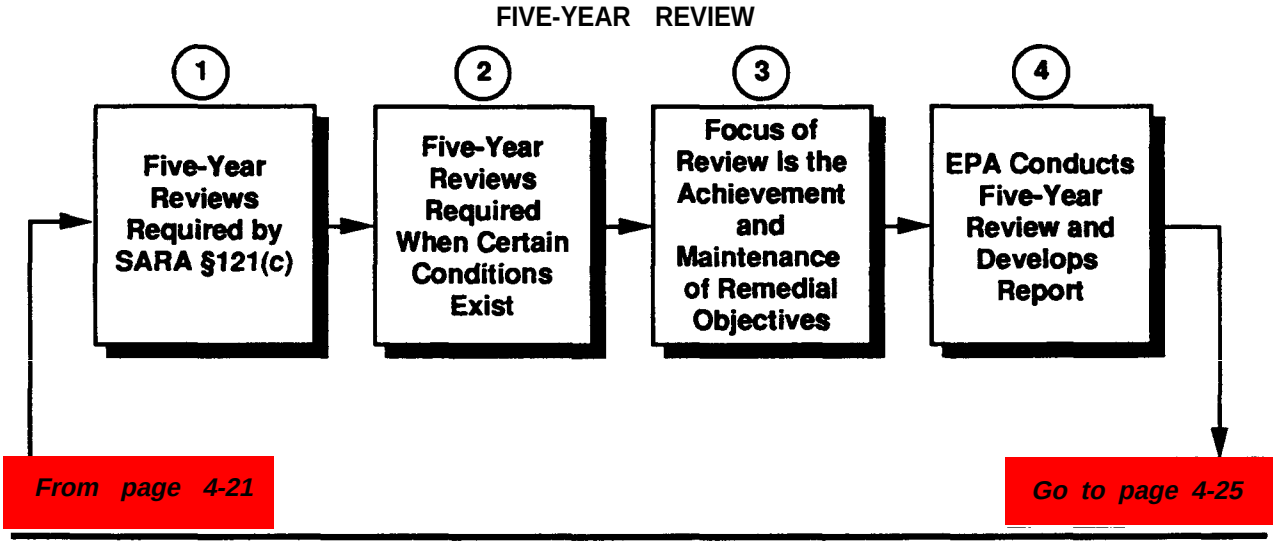



# XI. Determination of Technical Impracticability for a RCRA Corrective Action

**4.** **Determination of Technical Impracticability.** If, after a "reasonable effort" (which includes active efforts to achieve all requirements of the permit for a RCRA Corrective Action), DOE demonstrates the corrective measure is incapable of meeting a given performance standard of the modified permit, then, under the provisions of proposed 40 CFR §264.531, DOE may request a Determination of Technical Impracticability. It is the responsibility of DOE to provide EPA with all evidence and documentation to support such a determination. Following review of the information, EPA may require DOE to conduct an evaluation of additional alternatives, in a process similar to the CMS. The evaluations may focus on assessment of means to improve the effectiveness of the selected corrective measure, further assessment of alternatives already evaluated in the CMS, or assessment of alternatives not yet considered.

The Determination of Technical Impracticability represents a finding that remediation of the release is not feasible from a technical standpoint. Such a determination does not represent a discharge of the requirement to conduct RCRA Corrective Action, nor does it discharge DOE from its obligation for ultimate cleanup of the facility. EPA reserves the authority to require additional efforts if advances in technology provide a corrective measure capable of remediating the contamination at the facility.

**a.** Based upon these studies, EPA will issue either a modification to the permit requiring implementation of another corrective measure or, if all possible options for the corrective measure are completely impractical, a Determination of Technical Impracticability. A Determination of Technical Impracticability may include additional requirements to protect human health and the environment.




## XII. Five-Year Reviews Under CERCLA

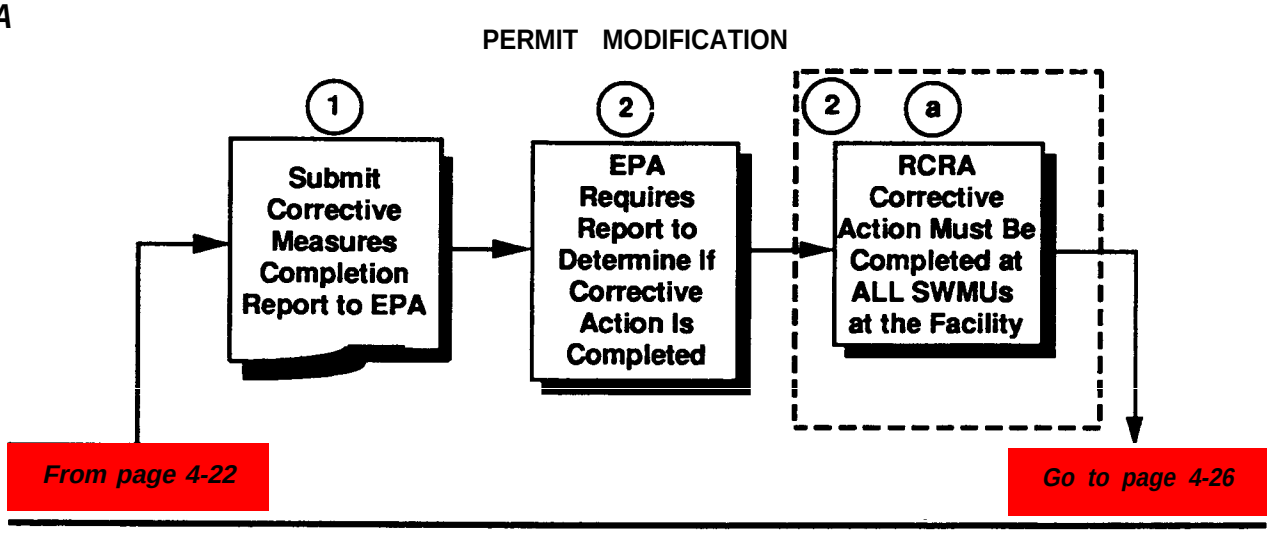
1. **Required by SARA §121(c).** Section 121 (c) of CERCLA requires EPA to conduct a review of the effectiveness of the RA every 5 years at certain sites. The purpose of these reviews is to determine if the RA continues to provide protection to human health and the environment. A 5-year review is not a condition for deletion from the NPL.

2. **When Certain Conditions Exist.** EPA conducts reviews at sites where:

   - **Attainment of the cleanup levels specified in the ROD will not allow unlimited use or unrestricted access; and**
   - **Hazardous substances will remain at levels onsite that prevent unlimited use or unrestricted access, and attainment of acceptable levels will take more than 5 years (e.g., LTRA sites).**

3. **Achievement end Maintenance of Remedial Objectives.** The focus of the review will depend upon the original remedial objectives and the specific remedy implemented at the site. For example, for those remedies where protectiveness is ensured through the limiting of exposure, the review will focus on the mechanisms and institutional controls used to prevent exposure. For LTRA sites, the review will focus on the effectiveness of the technology and the ability of the remedy to achieve the specific performance objectives established in the ROD.

4. **Five-Year Review and Report.** According to CERCLA §121, EPA is required to prepare and publish a report of the findings of the 5-year review. If the findings indicate that the site has achieved cleanup levels that allow for unlimited use and unrestricted access, there will be no requirement for additional reviews. If the review finds that the site is not remediated to levels allowing unlimited use or unrestricted access, another review will be conducted in 5 years.




## XIII. Permit Modification Ending RCRA Corrective Action

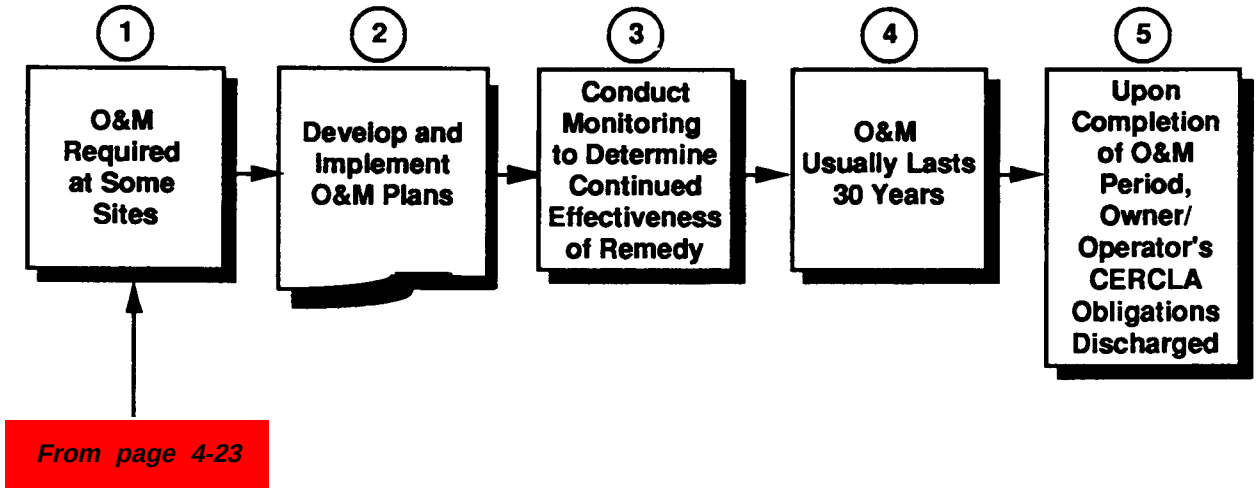
1. **Submit Completion Report to EPA.** DOE submits to EPA the report demonstrating completion of the corrective measure (certified by a qualified independent professional) claiming completion of the corrective measure.

2. **EPA Review of Completion Report.** EPA will review the evidence supporting the claim of completion. The specific factors EPA will assess include the following:

- **Demonstration of compliance with the MCS established in the modified permit**
- **Demonstration that all permit requirements for actions addressing the source of the release are satisfied: and**
- **Demonstration of compliance with the procedures specified in the permit for the removal and/or decontamination of all equipment, devices, or structures used in conducting the corrective measure.**

**a.** EPA will also determine if ***all*** RCRA Corrective Action requirements are completed at all units at the facility. Completion of RCRA Corrective Action occurs only upon completion of ***all*** corrective action activities at the facility. However, in the case of a completed corrective measure at a unit widely separated from and affecting different media than the other units at the facility, DOE may request a partial release from the RCRA Corrective Action program.

NOTE: All implementation and reporting requirements established in the permit remain in effect until ***all*** RCRA Corrective Action activities at the facility are completed. Failure to continue required actions such as monitoring or reporting, even if the corrective measure at an SWMU is complete, may represent noncompliance with the facility permit.

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## XIV. Operation and Maintenance of CERCLA Remedial Actions

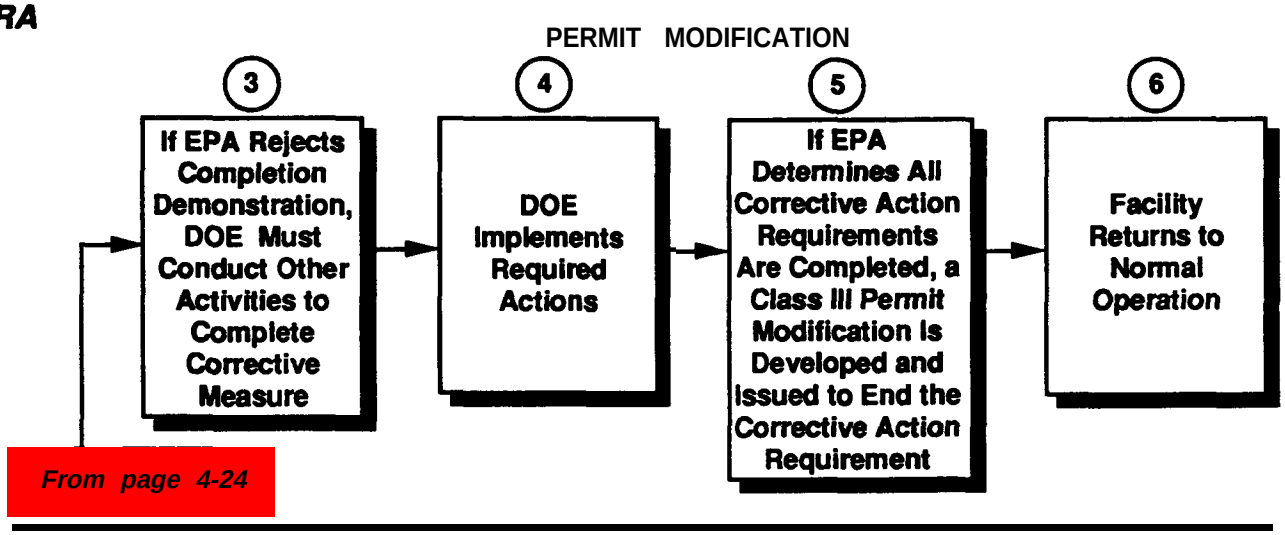
1. **O&M Required at Some Sites.** At sites where the remedy involves a permanent structure used to contain the contaminated materials, DOE, will be required to continue to operate and maintain the remedy. An example would be a requirement to maintain a cap covering an area of contaminated soils.

2. **Develop and Implement O&M Plans.** DOE will be required to develop O&MPs. An O&MP discusses the specific operation, maintenance, and monitoring activities for the remedy. In addition, an O&MP may include contingency plans that provide guidance on addressing problems that might arise over time.

3. **Conduct Monitoring to Determine Continued Effectiveness of Remedy.** As part of O&M, DOE may elect to conduct occasional sampling or other environmental monitoring activities to assess the effectiveness of the remedy. If such monitoring is to be conducted, DOE should develop a QAPP to provide specific guidance on these activities.

4. **O&M Usually Lasts 30 Years.** The O&M period is generally 30 years following completion of the remedy; however, EPA may revise this figure up or down to address site-specific conditions. The cost of the O&M operations should be included when developing cost estimates for the remedy.

5. **Obligations Discharged.** Following the completion of the O&M period, DOE would be released from its obligation to conduct CERCLA response. However, if future developments so dictate, EPA may require additional actions that are deemed necessary to protect human health and the environment.




3. **Addtional Action May Be Required.** If EPA determines that all RCRA Corrective Action requirements are not completed, EPA will reject the request and provide DOE with information on the actions required to complete the corrective measure. It is incumbent upon DOE to discuss any deficiencies with EPA before undertaking action to comply. DOE should negotiate with EPA to establish the actions required to complete the corrective measure and should insist that these requirements be made part of the facility permit, RCRA §3008(h) Order, or FFCA.

4. **Implement Addtional Action.** DOE will undertake the agreed-upon measures to complete the corrective measure.

5. **Once All Requirements Are Met, Permit Modified to End Corrective Action.** If EPA determines all requirements of the facility permit have been met, the request is processed as a Class III DOE-requested permit modification. A Class III permit modification requires the following:

- **Notification of all parties on the facility mailing list and the appropriate State and local governmental entities,**
- **Publication of a newspaper notice of the request,**
- **A 60-day comment period,**
- **A public hearing on the request, and**
- **A copy of the proposed modification and supporting documents being placed in a location accessible to the public.**

The requirements for Class III permit modifications are found at 40 CFR §270.42(c).

6. **Return to Normal Operations.** Once the final permit modification releasing the facility from the RCRA Corrective Action process is complete, DOE may continue normal operations.

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## Summary

| Topic | RCRA |
|---|---|
| **Designing the Corrective Measure/Remedy** | Under corrective action, the design of the corrective measure is part of CMI. |
| **Submission of planning documents** | Under proposed Subpart S, submission of planning documents for EPA review may be required as part of the facility's permit, §3008(h) Order, or FFCA. |
| **Planning Documents Required or Recommended** | • Program management plan;<br>• Public involvement plan;<br>• Design strategy document;<br>• Engineering calculations, drawings, and process flow diagrams;<br>• List of materials/equipment;<br>• Operation and maintenance plan;<br>• Training materials;<br>• Cost estimate;<br>• Schedule and critical path analysis;<br>• Data collection quality assurance plan;<br>• Construction quality assurance plan; and<br>• Health and safety plan. |
| **Sequence of Activities** | • Design the corrective measure,<br>• Construct the corrective measure,<br>• Implement the corrective measure,<br>• Operation and maintenance,<br>• Monitor the corrective measure,<br>• Demonstrate compliance with MCS, and<br>• Permit modification ending corrective action. |
| **Community Relations Required** | Required as part of the permit modification process, but recommended throughout CMI. |
| **EPA Oversight** | EPA may conduct periodic inspections and reviews of CMI progress. |
| **Cleanup Levels** | Called media cleanup standards, these levels are based on informed risk management decisions and are specified in the facility's permit, §3008(h) Order, or FFCA. |

## Summary

| Topic | CERCLA |
|---|---|
| **Designing the Corrective Measure/Remedy** | Under CERCLA, the design of the remedy (i.e., remedial design) is considered a separate activity from implementing the remedy. |
| **Submission of Planning Documents** | Under NCP, the submission of RD plans to EPA is not specifically mentioned; however, EPA may require submission of plans as part of the Consent Agreement or FFA. |
| **Planning Documents Required or Recommended** | • Community relations plan;<br>• Remedial design strategy;<br>• Engineering calculations, drawings, and process flow diagrams;<br>• List of equipment and materials;<br>• Operational guidance and training materials;<br>• Cost estimate;<br>• Schedule and critical path analysis;<br>• Quality assurance project plan;<br>• Construction quality assurance plan; and<br>• Health and safety plan. |
| **Sequence of Activities** | • Remedial design;<br>• Remedial action;<br>- Construct the remedy,<br>- Implement the remedy, and<br>- Monitor the remedy;<br>• Demonstrated compliance with cleanup levels set in the ROD;<br>• NPL deletion;<br>• Five-year reviews; and<br>• Operation and maintenance. |
| **Community Relations Required** | Extensive community relations activities required under CERCLA and the NCP. |
| **EPA Oversight** | Not specified under the NCP, but likely to occur during RA. |
| **Cleanup Levels** | Derived from ARARs under the NCP, the cleanup levels represent an informed risk management decision and are specified in the Consent Agreement or FFA. |

# References


The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (as amended by the Superfund Amendments and Reauthorization Act [SARA]). 42 USC §9601 et seq.

The Resource Conservation and Recovery Act (RCRA) (as amended by the Hazardous and Solid Waste Amendments [HSWA]). 42 U.S.C. §6901 et seq.

US DOE. *Public Participation in Environmental Restoration Activities (EH-0221).* Washington, DC: USDOE. 1991.

US DOE. *RCRA Corrective Action Program Guide (Interim Guidance).* Washington, DC: US DOE. May 1993.

USEPA. *A Guide to Developing Superfund Proposed Plans.* Washington, DC: USEPA. November 1989.

USEPA. *Corrective Action During Interim Status.* Washington, DC: USEPA. July 1984.

USE PA. *Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities (Proposed Rule). 55* FR *30798,* July 27, 1990.

USE PA. *Corrective Action Management Units and Temporary Units; Corrective Action Provisions (Final Rule). 58* FR 8658, February 16, 1993.

USEPA. *Corrective Action: Technologies and Applications (Seminar Publication).* Washington, DC: USEPA. September 1989.

USE PA. *Data Quality Objectives for Remedial Response Activities: Volumes 1 and 2.* Washington, DC: USEPA. March 1987.

USE PA. *Draft Guidance on Developing Superfund Decision Documents.* Washington, DC: USEPA. March 1988.

USE PA. *Enforcement Actions Under RCRA and CERCLA at Federal Facilities.* Washington, DC: USEPA. January 1988.

USE PA. *Federal Facilities Hazardous Waste Compliance Manual.* Washington, DC: USEPA. January 1990.

USEPA. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final).* Washington, DC: USEPA. October 1988.

USE PA. *Guide for Conducting Treatability Studies Under CERCLA (Interim Final).* Washington, DC: USEPA. December 1989.

USEPA. *Procedures for Completion and Deletion of National Priorities List Sites.* Washington, DC: USEPA. October 1988.

USE PA. *RCRA Corrective Action Plan (Interim Final).* Washington, DC: USE PA. June 1988.

USE PA. *RCRA Facility Investigation Guidance (Four Volume Set).* Washington, DC: USEPA. May 1989.

USEPA. *Structure and Components of Five-Year Reviews.* Washington, DC: USEPA. August 1991.

USE PA. *Update to the "Procedures for Completion and Deletion of National Priorities List Sites" - Guidance Regarding the Performance of Five-Year Reviews.* Washington, DC: USE PA. December 1989.